WHAT IS CLAIMED IS:

1. A magnetic recording medium at least comprising:

a substrate having a surface;

a nanoparticle layer comprising an array of nanoparticles having an average particle size of at least 1 nm and not more than 20 nm, and containing at least one element selected from the group consisting of Fe, Co, Ni, Mn, Sm, Pt, or Pd, and

an organic compound located between said array of nanoparticles;

wherein an easy axis of magnetization of said nanoparticles is orientated substantially parallel to a direction which is at a particular angle to said substrate surface.

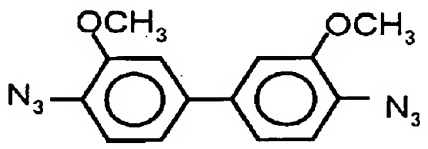
2. A magnetic recording medium according to claim 1 wherein said organic compound located between said array of nanoparticles is either an organic compound coating said nanoparticles, or a compound derived from said organic compound coating the nanoparticles.

3. A magnetic recording medium according to claim 1 wherein said organic compound located between said array of nanoparticles comprises the organic compound coating said

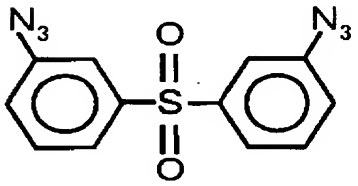
nanoparticles or the compound derived from said organic compound coating the nanoparticles;

and a crosslinking agent capable of binding adjacent organic compounds when it is irradiated with a light beam, a radiation or by applying heat.

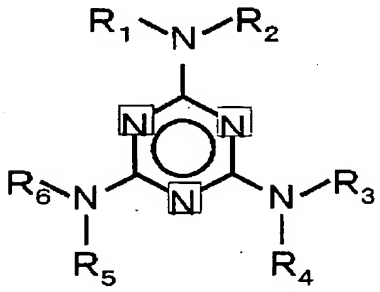
4. A magnetic recording medium according to claim 3 wherein said crosslinking agent has a structure selected from those represented by the general formulae (1) to (4):



(1)

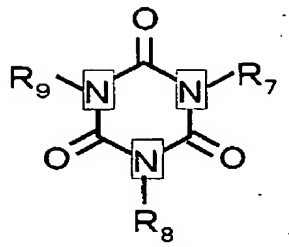


(2)



(3)

, and



(4)

wherein R1 to R9 are independently a functional group selected from the group consisting of carboxylic acids, phosphonic acids, phosphinic acids, sulfonic acids, sulfinic acids, thiols, hydroxyls, and a hydrogen atom; or a hydrocarbon group containing carbon-carbon double bond or ether bond.

5. A magnetic recording medium according to claim 1 wherein said easy axis of magnetization of said nanoparticles is substantially parallel to the direction of said substrate surface.

6. A magnetic recording medium according to claim 1 wherein said easy axis of magnetization of said nanoparticles is orientated substantially parallel to a direction which is at 45 degrees to said substrate surface.

7. A magnetic recording medium according to claim 1 wherein said easy axis of magnetization of said

nanoparticles is orientated substantially parallel to a direction which is perpendicular to said substrate surface.

8. A magnetic recording medium wherein the number of nanoparticles, having an angle between the direction perpendicular to said substrate surface and the easy axis of magnetization of said nanoparticles is up to 5 degrees, constitutes at least 90% of total number of nanoparticles included in the nanoparticle layer.

9. A magnetic recording medium according to claim 1 wherein said nanoparticle layer comprises a monolayer film of said nanoparticles.

10. A method for producing a magnetic recording medium comprising:

forming a nanoparticle layer on a substrate having a surface, or on an underlying layer or a soft magnetic layer formed on said substrate by arranging particles in a substantially ordered array,

forming the nanoparticles by making each of said particles comprise a nanoparticle and an organic compound coating said nanoparticle, wherein said nanoparticles, having an average particle size of at least 1 nm and not more

than 20 nm, and containing at least one element selected from the group consisting of Fe, Co, Ni, Mn, Sm, Pt, and Pd;

irradiating said nanoparticle layer with an infrared beam to magnetize said nanoparticles and produce magnetic nanoparticles;

applying a magnetic field to said nanoparticle layer to orient an easy axis of magnetization of said magnetic nanoparticles in a substantially uniform direction; and

irradiating said nanoparticle layer with an ultraviolet beam to bind said organic compound.

11. A method for producing a magnetic recording medium according to claim 10 wherein said step of forming the nanoparticle layer is accomplished by employing a Langmuir-Blodgett method wherein a colloid solution of the nanoparticles coated with the organic compound is added dropwise onto a water surface to form a monolayer film, and the thus formed film is compressed to obtain a film wherein nanoparticles are densely arranged.

12. A method for producing a magnetic recording medium according to claim 10 wherein said step of forming the nanoparticle layer is accomplished by employing spin coating wherein a colloid solution of the nanoparticles

coated with the organic compound is added dropwise onto the substrate and the substrate is rotated to form a thin film.

13. A method for producing a magnetic recording medium according to claim 10 wherein said infrared beam has a wavelength longer than 600 nm.

14. A method for producing a magnetic recording medium according to claim 10 wherein said ultraviolet beam has a wavelength shorter than 400 nm.

15. A method for producing a magnetic recording medium according to claim 10 wherein said infrared beam or said ultraviolet beam used, is a laser beam.

16. A method for producing a magnetic recording medium according to claim 10 wherein said magnetic field is a static magnetic field wherein direction and intensity of the magnetic field do not change with time.

17. A method for producing a magnetic recording medium according to claim 10 wherein when applying a magnetic field, said magnetic field is a pulse magnetic field wherein direction of the magnetic field applied is constant, and intensity of the magnetic field varies with time.

18. A method for producing a magnetic recording medium according to claim 10 wherein the magnetic field is applied in a direction substantially parallel to said substrate surface.

19. A method for producing a magnetic recording medium according to claim 10 wherein the magnetic field is applied in a direction which is substantially parallel to a direction at 45 degrees to said substrate surface.

20. A method for producing a magnetic recording medium according to claim 10 wherein the magnetic field is applied in a direction substantially parallel to a direction which is perpendicular to said substrate surface.

21. An apparatus for producing a magnetic recording medium comprising:

an infrared irradiating section for irradiating a substrate having a nanoparticle layer formed thereon with an infrared beam having the capability to magnetize nanoparticles and to produce magnetic nanoparticles, wherein said nanoparticle layer comprises an array of nanoparticles having an average particle size of at least 1 nm and not more than 20 nm, and containing at least one

element selected from the group consisting of Fe, Co, Ni, Mn, Sm, Pt, or Pd, and an organic compound between said array of nanoparticles;

a magnetic field applying section wherein a magnetic field is applied to said nanoparticle layer to orient an easy axis of magnetization of said magnetic nanoparticles in a substantially uniform direction; and

an ultraviolet irradiating section wherein said nanoparticle layer is irradiated with an ultraviolet beam to bind said organic compound.

22. An apparatus for producing a magnetic recording medium according to claim 21 wherein said apparatus further comprises:

a rotating section which rotates said substrate bearing said nanoparticle layer at an arbitrary rotation speed around a particular axis of rotation;

wherein said infrared irradiating section for irradiating a particular region of said substrate with the infrared beam, said magnetic field applying section for applying a magnetic field to said particular region after the infrared irradiation is applied, and said ultraviolet irradiating section for irradiating said particular region of said substrate with the ultraviolet beam after the

magnetic field application is applied, are concentrically arranged around the center of rotation.